

# Recreational Water Quality Guidelines



The Canadian Approach

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# Confederation

- 10 provinces, 3 territories, federal government
- Constitution - prov. own natural resources  
fed. responsible for national issues (health)
- F/P/T committees
- Environmental & Occupational Health
- reports to F/P/T DMs of Health

# History of Guidelines I

- 1979 WG established by HC at request of CEOH
- 1983 HC published guidelines
- addressed microbiological, chemical & physical characteristics
- GM of 200 FC/100 mL
- 5 samples in max. 30 days
- single sample max. of 400 FC/100 mL

GUIDELINES  
FOR CANADIAN RECREATIONAL  
WATER QUALITY



Canada

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## History of Guidelines II

- replaced guidelines based upon TC or FC where they existed
- WG recognised that EC was the definitive indicator based upon epi. studies, but
- no standard methods for EC, so FC recommended as the best alternative
- WG recognised that the use of FC was conservative

# History of Guidelines III

- 1988 CEOH asked HC to reconvene WG and review
  - existing indicators and guidelines
  - data from fresh and marine waters
  - methods for EC detection
  - recent epi. studies

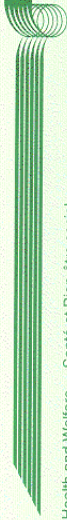
# History of Guidelines IV

- WG recommended that:
  - EC be the choice in fresh waters
    - GM 200 cfu/100 mL (5 samples, 30 days)
  - ENT be selected for marine waters
    - GM 35 cfu/100 mL (5 samples, 30 days)
  - no numerical guidelines for coliphage and for enteric and respiratory pathogens
- guidelines published by HC in 1992



Health and Welfare  
Canada

Santé et Bien-être social  
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# Guidelines for Canadian Recreational Water Quality



Canada

# Provincial “Improvements”

- Ontario uses GM of 100 EC/100 mL (under review)
- Quebec beach classification scheme
  - Category      FC/100 mL
  - Excellent      0-20
  - Good            21-100
  - Poor            101-199
  - Polluted        200+

# Current Activities

- WHO Guidelines for Safe Recreational-water Environments
- Research
  - rapid method for EC
  - pathogen occurrence and survival at sand water interface
  - rapid method for cyanobacterial toxins

# Great Lakes Beach Postings

• Lake	92	93	94	95	Total
• Ontario (45)	522	464	457	547	1990
• Erie (105)45	193	114	56	410	
• Huron (9) 36	17	40	17	110	
• Superior (10)	73	119	63	74	329
• All (169) 678	793	674	694	2839	

# Rapid E.coli method

- Current assessment based upon 1 to 2-day old data
- HC supported development of a 6 h (approaching real-time) method
- glucuronidase + dioxetane glucuronide = dioxetane (chemoluminescent)
- light emitted related to amount of enzyme and concentration of E. coli in sample

# Days for 3-log reduction

Organism	L. Ontario	L. Erie	L. Huron
E. coli	7	7	11
E. faecalis	6	5	11
S. typhimurium	8	4	4
S. sonnei	6	4	4
S. aureus	4	3	6
P. aeruginosa	unknown	unknown	unknown

# Microcystin Field Test Kit

- colourimetric assay based on inhibition of type 1 protein phosphatase activity
- sensitivity - 1.5  $\mu\text{g/L}$  in a 30 minute reaction time
- vigorous testing & validation planned for summer 2001

# Field Test Kit Results

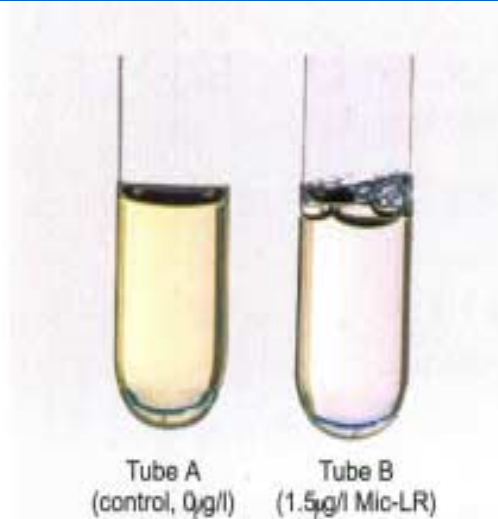


Figure 2: Field kit reaction after one hour incubation in heat pack.

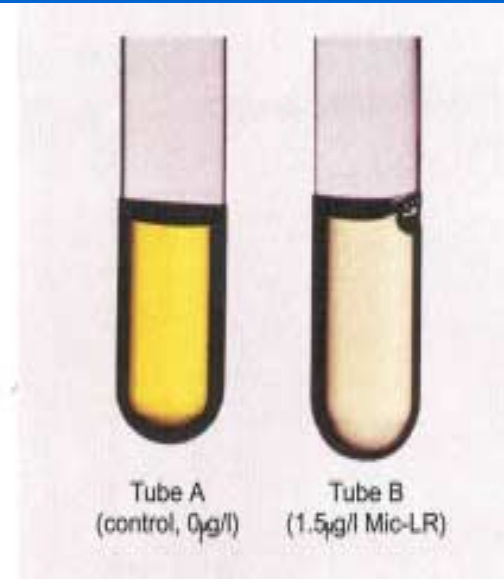


Figure 3: Field kit reaction after one hour incubation in heat pack then left for several hours at room temperature.

- absence of toxin: clear yellow colour
- presence of toxin: colourless solution

# Future Directions

- Are current guidelines adequate?
  - Children's health
  - Real-time results
  - Cyanobacterial toxins
  - Annapolis protocol



(New Yorker, August 14, 2000)